

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference AM/5244399	<div style="display: flex; justify-content: space-between;"> <div> FOR FURTHER ACTION </div> <div> <small>See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)</small> </div> </div>	
International application No. PCT/GB98/00170	International filing date (day/month/year) 20/01/1998	Priority date (day/month/year) 21/01/1997
International Patent Classification (IPC) or national classification and IPC H02J7/00		
Applicant Metrixx Limited et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 21/08/1998	Date of completion of this report <div style="text-align: right;">20.04.99</div>
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465 </div> </div>	Authorized officer Flyng, G Telephone No. (+49-89) 2399 2697



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International application No. PCT/GB98/00170

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-29 as originally filed

Claims, No.:

1-72 as originally filed

Drawings, sheets:

1/10-10/10 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
☒ claims Nos. 70-72.

because:

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- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 70-72.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-69
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-69
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-69
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

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VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claims 70 to 72 cannot be examined because they were not covered by the international search report.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The documents cited in the search report will be referred to using the following reference numbering:

D1 = WO 93 08629 A (NORVIK TECHNOLOGIES INC) 29 April 1993

D2 = WO 83 00740 A (TOWMOTOR CORP) 3 March 1983

2. The **closest prior art** is considered to be the known "daisy-chain" cell monitoring system described from page 2 line 32 to page 3 line 7 of the present application. This comprises essentially a plurality of cell monitoring devices, each connected to its corresponding battery cell (and presumably powered by it) and each serially connected to its neighbour in a daisy chain configuration by some form of isolation device (optical or transformer).
3. As noted below in the paragraphs referring to section VIII the broadest of the independent apparatus claims is considered to be **claim 61** for the cell signalling device. The matter defined in claim 61 seems to differ from the cell monitoring device in the known "daisy-chain" system in that it includes the **DC level shift circuit** operable as set out in the claim. Such a level shift circuit would not be necessary in a daisy chain provided with isolation between devices. Thus, claim 61 is novel, Article 33(2) PCT.
4. Document D1 = WO 93 08629 A discloses a battery monitoring system in which a single voltage sampling circuit is connected to each battery cell in turn in order to

sequentially sample the cell voltages. This disclosure is no more relevant than the "daisy-chain" system and does not suggest any form of level shift circuit.

5. Document D2 = WO 83 00740 A describes a circuit for monitoring the total voltage of a battery. A conditioning circuit is provided to shift the input battery voltage, enabling the circuit to be used for batteries having different rated voltages. The circuit does not contemplate monitoring individual cells and therefore does not suggest to a DC level shift circuit operable to shift the DC level of a received input in order to provide a level shifted output as claimed.
6. Thus, none of the available prior art would lead the skilled person to the matter defined in claim 61, without involving an inventive step, Article 33(3) PCT.
7. Independent apparatus claims 1, 62 and 67 include all of the features of the signalling device defined in claim 61 and are therefore also considered to meet the requirements of Article 33(2) and (3) PCT.
8. Similarly, Independent method claim 69 comprises method steps corresponding to the apparatus features of the cell signalling device defined in claim 61. Claim 69 is therefore also considered to meet the requirements of Article 33(2) and (3) PCT.
9. Each of the remaining claims is dependent on one of the above claims and is therefore also considered to meet the requirements of Articles 33(2) and (3) PCT.

Re Item VII

Certain defects in the international application

1. The independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the closest prior art being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT). As noted in section V above the closest prior art is considered to be the known cell monitoring system described from page 2 line 32 to page 3 line 7 of the present application.

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2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
3. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the description does not identify a document reflecting the prior art described from page 2 line 32 to page 3 line 7 of the present application. Furthermore, the description does not identify the prior art document D1 and does not acknowledge the relevant background art disclosed therein.

Re Item VIII

Certain observations on the international application

1. The set of claims 1 to 69 effectively includes **5 independent claims**, namely:
 - claim 1- a signalling system for a plurality of **cells** including a communication link and a plurality of cell signalling devices at least one of which comprises a DC level shift circuit;
 - claim 61- a cell signalling device comprising a DC level shift circuit;
 - claim 62- a cell signalling device having the features thereof as defined in claims 1 to 60;
 - claim 67- a signalling system for a plurality of **systems** including a communication link and a plurality of signalling devices at least one of which comprises a DC level shift circuit;
 - claim 69- a signalling method which corresponds generally to the system defined in claim 1.
2. It is noted that claims 61 and 62 are considered as independent claims because, whilst they refer to preceding claims they do not include all of the features defined in these preceding claims (PCT/GL3, C-III, 3.5 and 3.7a).
3. It is further noted that claims 1, 61, 62 and 67 are all claims of the "apparatus" category (PCT/GL3, C-III, 3.2).
4. Comparing the apparatus claims which refer to battery cell signalling (claims 1, 61 and 62) it can be seen that the only feature of claim 61 which is not explicitly

defined in claim 1 is a "power input terminal connectable to the cell". However the fact that claim 1 defines that the cell signalling devices are powered by the cells makes it implicit that the cell signalling devices have a power input terminal connectable to the cell. **Claim 1 thus effectively comprises all the features of claim 61 and should therefore have been formulated as a claim dependent on claim 61, Rule 6.4 PCT.**

5. **Claim 62 lacks clarity, Article 6 PCT.** In order to establish the scope of protection afforded by the formulation "having the cell signalling device features of any of claims 1 to 60" the reader would have to study each of these claims and separate from each one those features which define the cell signalling device. This places an undue burden on the reader and therefore renders the scope of protection obscure.
6. Claim 67 and its dependent claim 68 define a signalling system for use in a plurality of **"systems each operating at a different reference voltage"** and claim 67 states that each of the plurality of signalling devices is powered by a respective one or more of said plurality of "systems". These claims are therefore not limited to a signalling system for use with series connected **batteries**. Throughout the description and drawings, however, reference is made only to the signalling system being used for series connected batteries. There is no hint or suggestion that the system could or should be used for any systems other than batteries. The scope of claims 67 and 68 is thus broader than is justified by the description and drawings. **Claims 67 and 68 are therefore not supported by the description, contrary to Article 6 PCT.**